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FISHES OF IRAQ AND THE ARAB GULF :

ORDERS SQUALIFORMES AND RAJIFORMES

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INTRODUCTION

The considerable expansion of fisheries industry in Iraq and other countries surrounding the Arab Gulf has made the study of the systematics of fishes in this region a pressing need. Such kind of study forms the first step towards exploiting the fishery resources and formulating a common policy for development and management of these resources.

This paper deals with the first group of fishes which includes the sharks (order Squaliformes) , and the rays and skates (Order Rajiformes) from fresh waters of Iraq and the Arab Gulf. All these fishes are marine. however, few of them ascend the rivers Shatt-al-Arab, Tigris and Euphrates to the border of tide or beyond.

The cartilaginous fishes of Iraq and the Arab Gulf are poorly known. Day (1878) reported the Ganges shark, **Carcharhinus gangeticus,** from the Tigris river at Baghdad. Lane (1916) described two species of sharks and Kennedy (1937) reported one species of shark from the Tigris river. Graman (1913) indicated the occurrance of **Torpedo sinus-persici** in the Arab Gulf. The study of Blegvad (1944) was more significant. He described seven species of sharks and 13 species of rays and skates from the Arab Gulf. Notable works on cartilaginous fishes of the region were also done subsquently by Menon (1960) , Khalaf (1961), Mahdi (1962), Mazhar (1966), Mahdi and George (1969), Bibik (1970), White and Barwani (1971), Mahdi (1971), Volvic and Al-Kholy (1972), Kuronma and Abe (1972) and Al-Daham (1974).

The present study is based on previous literature and on the collection of fishes by the Basrah Natural History Museum and the Department of Biology, University of Basrah. Classification used here follows those of Bigelow and Schroeder (1948,1953), Romer (1966) and Norman (1966). Families and genera are systematically arranged but the species under their respective genera are arranged alphabetically. The original reference for each species is always cited. This is followed by synonyms used in regional faunas, Arabic local names and distributions.

As regards illustrations those taken from other works are duly acknowledged in the legends of the figures.

SYSTEMATIC ACCOUNT

ORDER SQUALIFORMES

SHARKS

Body torpedo shaped, possessing five to seven pairs of lateral gill openings. Anterior edge of pectoral fin not attached to side of head anterior to gill openings. Teeth arranged in one to four series of functfonal type and one to several of reserve type. One or two dorsal fins. Anal fin either present or absent. Caudal fin heterocercal, with well developed upper lobe. Male with a pair of myxopterygia formed at the edges of pelvic fins. Fertilization internal. Food composed of fishes and crustaceans. Only one suborder in the Arab Gulf and nearby inland waters of Iraq.

SUBORDER LAMNOIDEI

MODERN SHARKS

Head either normal or laterally extended. Snout neither swordlike nor bearing lateral teeth. Five pairs of gill arches and five pairs of gill openings. Nictiating membrane either present or absent. Spiracles present in some. Rostral cartilages, if present, not more than three. Two spineless dorsal fins. Five families in the Arab Gulf.

Key to families of suborder **Lamnoidei**

1 a. Nouth terminal, gill arches connected with each other by spongy masses.
RHINCODONTIDAE

1 b. Mouth inferior, gill arches not connected with each other by spongy masses.

2 a. Anterior margin of nostril with a barbel
ORECTOLEBIDAE

2 b. Anterior margin of nostril without abarbel

3 a. Head expanded laterally
SPHYRNIDAE

3 b. Head of normal shape, not expanded. laterally,

4 a. Teeth low, rounded and pavment-like, with several series functional
TRIAKIDAE

4 b. Teeth blade-like, with one series functional
CARCHARHINDAE

FAMILY ORECTOLOBIDAE

CAT SHARKS & CARPET SHARKS

Head of normal shape. Eyes small, lower lid without nictitating membrane. Anterior margin of nostril with well developed fleshy barbel. Spiracles present. Mouth inferior, transverse, lips with fleshy folds at corners of mouth. Oro-nasal groove deep; connecting between mouth and nostril. Teeth small, with several cusps. Gill arches without spongy masses connecting them togeher. Origin of first dorsal opposite or behind origin of ventral fins Caudal fin not lunate, its length. less than half body length, narrow and not lobed. Longitudinal dermal ridges present or absent. Precaudal pits. Development either oviparous or ovoiviparous. They live on bottom in shallow water . feeding on invertebrates and fishes. Of the 12 genera belonging to this family , only one genus present in the Arab Gulf.

GENUS HEMISCYLLIUM SMITH

Hemiscyllium Smith, Proce. Zool. Soc. London. 1838 : 86 (type: **Squalus ocellatus** Bonnaterre).

Head short and depressed. Snout brounded. Mouth closer to the line between the anterior edge of eyes than tip of snout. The lower labial furrow not crossing mentum. Body length from tip of snout to center of cloaca shorter than tail. Back with one or three longitudinal ridges. First dorsal fin posterior to ventral fins. Only one species present in the Arab Gulf.

HEMISCYLLIUM GRISEUM (MULLER AND HENLE)

RIDGE-BACK CAT SHARK

Fig. 1

Chiloscyllium griseum Muller & Henle, Syst. Beschr. Plagiost ., 1841 : 19 (type locality : India; Japan). - Blegavad Danish Sci. Invest. Iran, pt. 3, 1944 : 35, pl. 1, fig, 1. — Mazhar, Bull. Biol. Res. Centre, Baghdad, 2, 1966 : 44, figs. 1 and 2. — Mahdi, Iraq Nat. Mus. Pub. 28, 1971 : 4, 1, fig. 1. — Kuronuma and Abe , Fish. Kuwait, 1972 : 43, fig. 1.

Local Names. Hayassah; Kossetch Al-Qitt; Lehi.

Head moderately flattened above. Snout short and broadly rounded, its length in front of mouth nearly one-fourth the length to fifth gill opening. Eye narrow, oval, about twice as broad as high, its horizontal diameter about half as long as snout in front of mouth. Spiracle oval, its long axis oblique, about as long as diameter of eye in large specimen (667 mm), but a little shorter than eye in small (270 mm), situated close behind the posterior margin of the eye. Nostril nearly longitudinal, its posterior end connected with the mouth by a deep open groove, its anterior edge connected with a tapering fleshy barbel (cirrus) reaching backward to the mouth. Gill openings low on sides of neck, oblique, the first to fourth widely spaced, but fourth and fifth gill slits close together, the third over margin of pectoral fin, the fifth slightly longer. Mouth transverse, with well developed labial folds on lower jaw, its breadth nearly equal to length of snout in front of mouth, its corners with deep furrows, the upper extending inward to edge of the groove and the lower a little farther, but far from being continuous across chin. Teeth minute, alike in both jaws with three cusps, the median much the longest, slender, narrow, and sharp-pointed; nearly seven series fcnctional in the upper jaw and nine in the lower; those toward corners of month with relatively less functional rows and shorter cusps.

Trunk subcylinderical and tapering rearwards, its breadth opposite origin of pectorals about one-ninth to one-tenth of total length. Midline of back with one dermal ridge running rearward from about opposite first gill opening nearly to a short distance before the origin of second dorsal. Caudal peduncle compressed laterally without precaudal pits either above or below. Body sector from snout to cloaca much shorter than tail sector. Dermal denticles very small, loosely spaced or overlapping; the blades varying in size, usually with three ridges, the axial much the strongest; the margin with one tooth; pedicle slender and relatively short.

First and second dorsal fins similar in shape with nearly straight anterior margins, rounded apices, slightly concave rear margins and subacute rear corners. Origin of first dorsal fin nearly over midpoint of base of ventral fins, its vertical height about as long as base. Second dorsal fin nearly or quite as long as first dorsal at base. its origin about midway between origins of first dorsal and upper caudal. Caudal about one-fourth of total length, its axis very slightly raised, its upper margin nearly straight, its terminal sector transversely truncate with rounded corners, occupying about one-third total length of the fin, its lower anterior and posterior margins nearly straight, with strongly deve loped subterminal notch. Anal fin separated from caudal by a definite notch, but continuous with later at its base, its vertical height about one-fourth to one-fifth the length of its base. Ventral fins about as long as base of pectoral fin, with slightly convex anterior margin, very weakly convex posterior margin. Claspers compressed dorso-ventrally, reaching two-third of the length of the ventral fins in immature males and extending beyond ventral tips in adults. Pectoral fin about one and half times as large in area as first dorsal, nearly two third as broad as long, its outer margin very weakly convex, its distal margin nearly straight, its corners broadly rounded. Upper surface greyish yellow, lower lighter, none of them showing the cross bars seen in specimens from Arabian Sea and Red Sea.

Description prepared from four males ranging from 270 mm. to 667 mm., and three females ranging from 260 mm. to 520 mm. length. from northern sector of the Arab Gulf near the mouth of Shat-al-Arab River.

Distribution :- Abundant in Arab Gulf, also in the Arabian sea, Red Sea, Malay Archipelago, China and Japan.

FAMILY RHINCODONTIDAE

WHALE SHARKS

Head large, mouth wide and terminal, eyes and spiracles small. Gill arches connected with each other by spongy masses of tissue forming a sieve with small openings. Anterior margin of nostril without a barbel. Lower eyelid without nictitating membrane. Corner of mouth with fleshy folds. Teeth small, numerous and in many series. Two dorsal fins, the first much larger than the second. Caudal fin lunate, its axis sharply raised. Precaudal pit on upper surface only. Sides of trunk with longitudinal dermal ridges anterior to anal fin. One genus.

GENUS RHINCODON SMITH

Rhincodon Smith, Zool. Journ. London. 4, 1829 : 443 (type : **Rhincodon typus** Smith) .

Body spindle shaped, snout broad and flat, eyes lateral and without nictitating membrane. Mouth terminal, its corners with fleshy folds.

Teeth very small, Lower lobe of caudal well developed. One species distributed in all tropical seas and oceans.

RHINCODON TYPUS SMITH

WHALE SHARK

Fig. 2

Rhincodon typus Smith, Zool. Journ. London. 4,1829 : 443 (type : locality : Table Bay, South Africa). — Blegvad, Danish Sci. Invest. Iran, pt. 3, 1944 : 34, fig. 6. — Mahdi, Iraq Nat. Hist, Mus, Pub, 28, 1971 : 5, pl. 1. fig. 2. — White and Barwani, Comm. Sea Fish , Arab Gulf and Gulf of Oman, 1, 1971 : 11.
Local Names :- Channaz ; Kossetch Al-Hoot.

Body robust. Sides of trunk with a pair of longitudinal dermal ridges anterior to anal fin. Upper precaudal pit present. First dorsal fin closer to precaudal pit than to tip of snout, its origin anterior to ventral fin origin. Second dorsal larger than anal fin, its origin anterior to anal origin. Caudal lunate, very large. Skin with small placoid scales. Colour dark brown with irregular pale spots. Harmless. Food composed of plankton, small animals, and fishes.

Distribution :- All temperate and tropical seas, occasionally seen in the Araba Gulf.

FAMILY TRIAKIDAE

SMOOTH DOGFISHES

Head of normal shape, short and pointed. Lower eyelid without nictitating membrane but with external longitudinal fold. Oro-nasal groove present or absent. Barbels absent. Spiracles present or absent. Teeth low, rhomboidal, or if sharp with three to five cusps, usualy in mosaic arrangement, several series functional together. Two dorsal fins, the first much shorter than the caudal, its base terminating anterior to origin of ventral fins. Caudal not lunate, its length much lses than half total length. Size small. Harmless. Development either viviparous or ovovivparous. One genus in the Arab Gulf.

GENUS MUSTELUS LINK

Mustelus Link, Mag. Physik. Naturgesch. Gotha, 6, 2, 1790 : 31 (type : **Squalus mustelus** Linnaeus) .

Head short, flattened, snout pointed. Spiracles present. Corners of mouth with well developed labial furrows on upper and lower jaws. Oronasal groove absent. Teeth small, numerous, low, in mosaic arrangement, Posterior margins of dorsal, anal, and ventrals moderately concave, their posterior ends produced. Origin of anal below base of second dorsal. Caudal with well marked subterminal notch. Precaudal pit lacking. One species in the Arab Gulf.

MUSTELUS MANAZO BLEEKER
GUMMY SHARK

Fig. 3

Mustelus manazo Bleeker, Verh. Batav. Genootsch, Japan, 26, 1857 : 126 (type locality : Nagasaki) . — Blegvad, Danish Sci. Invest Iran pt. 3, 1944 : 42, figs. 13, 14 — White and Barwani, Comm. Sea Fish. Arab. Gulf and Gulf of Oman, 1, 1971 : 13

Local Names :- Kossetch ; Yuryur ; Jar jur.

Snout pointed, mouth crescentic, with long labial folds. Spiracles present, though small . Last gill opening small , above pectoral fin. Nasal closer to mouth than to tip of snout. Lower eyelid with longitudinal dermal fold externally, Teeth small, in mosaic arrangement. Origin of first dorsal above inner angle of pectoral fins. Origin of second dorsal a little anterior to origin of anal fin. Precaudal pit absent. Grey brown above, whitish below. Length up to 1.5 meters. There is one specimen in our collection with the following measurements :-

Total length = 620 mm.
Height of trunk at origin of pectoral = 70 mm.
Snout length in front of mouth = 46 mm.
Snout length in front of eye = 55 mm.
Breadth of mouth = 34 mm.

Distribution :- The Arab Gulf. Arabian Sea and Indian Ocean.

FAMILY CARCHARHINIDAE
REQUIEM SHARKS

Body subcylindrical, elongated. Head of normal shape, depressed, not extended laterally. Lower eyelid fith nictitating membrane. without folds. Mouth crescent-shaped. Oronasal groove absent. Barbels absent. Labial furrows confined to corners of mouth. Gill arches without gill rakers. Spiracles present in some genera. First dorsal fin much shorter than caudal, its base completely anterior to ventral origin. Second dorsal small, opposite anal fin. Caudal not lunate, its length much less than half total length, with well developed subterminal notch and a distinct lower lobe. Precaudal pits more or less distinct. Teeth triangular, blade-like, with one conspicuous cusp, arranged in longitudinal rows of which only one functional along sides of jaws. Development ovoviviparous or viviparous. The majority of sharks in the Arab Gulf belong to this family and some of its members are very dangerous to bathers. Some species enter Shatt-al-Arab, Tigris and Euphrates.

Key to genera of family **Carcharhinidae**

1 a. Spiracle present.

  2 a. Caudal peduncle with lateral dermal ridge
  Galeocerdo

  2 b. Caudal peduncle without lateral dermal ridge
  Hemigaleus

1 b. Spiracles absent.

  3 a. Margins of cusps of teeth smooth in both upper and lower jaws.

    4 a. Bases of upper teeth as well as lowers smooth
    Scoliodon

    4 b. Bases of upper teeth serrated
    Hypoprion

  3 b. Margins of cusps of teeth serrated in upper jaw, those of lowers either serrated or smooth.
  Carcharhinus

GENUS HEMIGALEUS BLEEKER

Hemigaleus Bleeker, Verh. Batav. Genootsch., 24, 1852 : 45

(type : **Hemigaleus microstoma** Bleeker).

Head flat and depressed at lower surface. Snout longitudinally produced. Eyes of medium size, lower lid with nictitating membrane. Spiracles present though size small. Lips with distinct folds. First dorsal opposite space between pectoral and ventral fins. Caudal with well developed subcaudal lobe, and distinct subcaudal notch. Precaudal pits well developed above and below. Caudal peduncle without longitudinal dermal ridges. Teeth dimorphous, the upper teeth serrated but lowers smooth. Size small. One species in the Arab Gulf.

HEMIGALEUS BALFOURI DAY

BALFOUR'S SHARK

Fig. 4

Hemigaleus balfouri Day, Fish. India, 1878 : 717, pl. 135, fig 4 (type locality : Waltair, Cormandel Coast, India). - Blegvad, Danish Soi. Invest. Iran, pt. 3, 1944 : 40, fig. 11. Al-Daham, Bull. Basrah Nat. Rist. Mus., 1, 1, 1974 : 101 , figs. 1 and 2.
Local Names : Kossetch; Jar jur; Krabi

Head flattened from above. Snout thin-tipped, narrow-ovoid, its length in front of mouth about one-third the length of head to origin of pectoral fin. Spiracle a minute slit behind eye. Nostril closer to mouth than to tip of snout. Corners of mouth with labial folds on both jaws. Upper teeth triangular, with inner margins nearly straight, the outer margins oblique, deeply notched toward corners of mouth with three to four denticles on outer side of base; lower teeth with slender unserrated cusps, broad, and without denticles. First dorsal larger than second, its origin a little posterior to axil of pectoral. Second dorsal about as large as anal, its origin a little anterior to the origin of anal. Caudal nearly 22% of total length. Dark brown, second dorsal with black summit. Total length of specimen studied 805 mm (female). Distribution :- Known from different parts of the Arab Gulf, Arabian Sea, and Indian Ocean.

GENUS GALEOCEROD MULLER AND HENLE

Galeocerdo Muller and Henle, Sits. Ber. Preuss. Akad. Wiss. Berlin , 1837 : 115 (type : **Squalus arcticus** Faber) .

Head depressed, mouth crescent-shaped. Spiracles present, small behind eye. Teeth alike on both jaws, triangular, with serrated margins. Lower eyelid with nictitating membrane. Labial folds on both jaws. First dorsal opposite space between pectoral and ventral fins. Origin of second dorsal above or slightly before origin of anal. Base of anal a little longer than base of second dorsal. Caudal peduncle with longitudinal dermal ridge on each side. Midback with longitudinal low dermal ridge. Precaudal pits above and below. Development ovoviviparous. The genus includes only one species in the Arab Gulf.

GALEOCERDO CUVIERI (LESUEUR)

TIGER SHARK

Fig. 5

Squalus cuvier LeSueir, Journ. Akad. Nat. Sci, Phila.. 2, 1822 : 351 (type locality : North west coast of New Holland).

Galeocerdo cuvier, White and Barwani, Comm. Sea. Fish. Arab. Gulf and Gulf of Oman, 1, 1971 : 15.

Laocal Names :- Kessetch; Jar jur; Sawaar.

Snout blunt. Eyes closer to tip of snout than to first gill opening. Labial folds on upper jaw longer than those on lower. Teeth compressed serrated, with notched external margin. Origin of first dorsal opposite axil of pectoral. Origin of second dorsal slightly anterior to origin of anal. Ventral fins small, closer to second dorsal than to first dorsal. Caudal long, pointed, its length ranging between one-third of total length before maturity to one-fourth of total length after maturity. The colour of immature sharks light grey with many, irregular darker spots on different parts of body. Very dangerous, attacks bathers.
Distribution :- Very rare in the Arab Gulf. Present in Arabian Sea, Indian Ocean.

GENUS SCOLIODON MULLER AND HENLE

ScoliodonMuller and Henle, Sitzungsber. Akad. Wiss. Berlin, 1837:117 (type : **Carcharias (Scoliodon) laticaudus** Muller and Henle). Bigelow and Schroeder, Fish W. N. Atl., 1948 : 292.

Body length from tip of snout to cloaca nearly as long as tail. Lower eyelid with nictitating membrane. Spiracles absent. Mouth curved, labial furrows either limited to corners of mouth, or extending on one jaw or both. Teeth alike on both jaws, blade-like, smooth, with inner margins deeply notched, bases of teeth not enlarged. Base of first dorsal more than twice as long as base of second dorsal, but base of anal not more than twice as long as base of second dorsal. Midpoint of base of first dorsal about equidistant from origin of ventrals and axil of pectoral. Precaudal pits above and below. Peduncle without longitudinal dermal ridges. Anterior lobe of subcaudal prominant. Members of this genus are small sharks, the length reaches upto 100 cm. One species in the Arab **Gulf.**

SCOLIODON WALBEEHMI (BLEEKER)

WALBEEHM'S SHARP-NOSED SHARK.

Fig. 6

Carcharias (Scoliodon) walbeehmi Bleeker, Nat. Tijds. Neederland , Indie, 10, 1856 : 348 (type locality : Rio, Bintang Island).

Local Names :- Keossetch; Jar jur.

Body length from tip of snout to cloaca slightly longer than tail. Corners of mouth with long-labial furrows on upper jaw, equal in length to diameter of eye, while the lower one is much shorter. Nasal opening closer to mouth than to tip of snout. Snout length equidistant from eye to second gill opening. Teeth with serrated margins. Posterior margin of pectoral slightly concave. Second dorsal smaller than anal, its origin above posterior part of base of the latter. Dorsal surface brownish grey, ventral surface whitish. Size small.

Distribution :- Rare in the Arab Gulf. Spreading in the Arabian Sea. Indian ocean, China and Japan.

GENUS HYPOPRION MULLER AND HENLE

Hypoprion Muller and Henle, Syst. Beschr. Plagiost. 1841 : 34 type: **Carcharia (Hypoprion) macloti** Muller and Henle). - Bigelow and Schroeder, Fish, W. N. Atl., 1948 : 315.

Body length from tip of snout to cloaca a little longer than tail . Lower eyelid with nictitating membrane. Spiracles absent. Labial furrows short on upper jaw, absent on lower. Teeth on upper jaw very oblique, notched on outer margins or erect with smooth cusps, but teeth bases either serrated or with low denticles on outer side, but indistinctly serrated on inner. Midpoint of base of first dorsal closer to axil of pectoral than to origin of ventrals. Base of first dorsal twice as long as base of second dorsal. Precaudal pits present above and below. Peduncle without longitudinal dermal ridges. Anterior lobe of subcaudal prominent. One species in the Arab Gulf.

HYPOPRION PALASORRAH (CUVIER)

GREY SHARK

Fig. 7

Carcharias palasorrah Cuvier, Regne Anim., 2, 1829 : 388 (on Palasorrah Russel, Fishes of Coromandel, 1, 1803 : 9, pl. 14 (type locality : Vizagapatam; Madras) .

Scoliodon palasorrah, Mazhar; Bull. Biol. Res. Centre: Baghdad Univ., 2, 1966 : 46.

Carcharias palasorrah, Mahdi, Iraq. Nat. Hist. Mus. Pub. 28, 1971 : 3.

Local Names :- Kossetch; Jar jur.

Snout before mouth as long as or less than distance between eye and first gill opening. Mouth arched, its length less than its breadth. Corners of mouth with labial folds. Nasal opening a little closer to mouth than to tip of snout. Upper teeth with fine serration on the inner sides of their bases and coarse serration on outer sides. Bases of teeth on lower jaw without serration. Base of first dorsal closer to base of ventral fin than to base of pectoral. Origin of second dorsal opposite end of base of anal. Upper surface grey. lower whitish. Margins of pectoral, ventral and anal fins whitish. Length reaches to 120 cm.

Distribution :- The Arab Gulf, Arabian Sea, Indian Ocean, China and Japan.

GENUS CARCHARHINUS BLAINVILLE

Carcharhinus Blainville, Bull. Soc. Philom, Paris, 8, 1816 : 121 (type **C. commersonii** Blainville).- Bigelow and Schroeder, Fish W. N. Atl., 1948 : 320.

Body elongated, spindle-shaped. Body sector from tip of snout to cloaca either less or more than tail sector. Snouth produced longitudinally. Lower eyelid with well developed nictitating membrane. Upper labial furrow very short, lower labial furrow lacking. Spiracles absent. Teeth subtriangular, cusps of uppers regularly serrated, of lowers either serrated or smooth. First dorsal subtriangular with concave posterior margin. Second dorsal either same size, smaller, or larger than anal. Caudal peduncle without dermal ridges. Upper precaudal pit well developed to hardly distinguished. Development viviparus. Six species in the Arab Gulf, of these some enter Shatt-al-Arab, Tigris and Euphrates.

Key to species of genus **Carcharhinus**

1 a. Second dorsal and anal equal in size.
  2 a. Teeth of lower jaw unserrated

menisorrah

  2 b. Teeth of lower jaw serrated

spallanzani

1 b. Second dorsal smaller or larger than anal.
  3 a. Second dorsal smaller than anal.
    4 a. Origin of second dorsal opposite origin of anal

limbatus

    4 b. Origin of second dorsal behind origin of anal

soorrah

  3 b. Second dorsal larger than anal.
    5 a. Snout very short, its length before mouth about 1/3 length of head before first gill opening.

gangeticus

    5 b. Snout long, its length before mouth equal to 1/2 length of head before first gill opening.

lamia

CARCHARHINUS GANGETICUS (MULER AND HENLE)

GANGES SHARK

Fig. 8

Carcharias (Prionodon) gangeticus Muller and Henle, Syst. Beschr. Plagiost., 1841 : 39, pl. 13 (type locality : Ganges River).
Carcharhinus gangeticus, Khalaf, Mar. F. W. Fish. Iraq, 1961 : 9.
Local Names:- Kossetch, Jar jur.

Snout blunt, very short, its length in front of mouth about 1/3 length of head in front of first gill opening. Mouth large, its length about half its width. Corners of mouth with very short labial folds. Teeth subtriangular, all serrated, uppers broad with very distinct notch in outer margin in immature sharks, disappearing with maturity, lower teeth erect, narrower in the cusps, broad based. Origin of first dorsal above end of pectoral base. Second dorsal larger than anal, its origin slightly before origin of the latter. Anal closer to caudal than to ventral fin. Pectoral subfalciform, angles pointed. Subcaudal lobe prominent. Greyish above, lighter beneath. Length up to 8 meters.

Distribution :- The Arab Gulf, Arabian Sea, Indian Ocean. Ascending Shatt-al-Arab, Tigris and Euphrates to above tidal influence.

CARCHARHINUS LAMIA (BLAINVILLE)

LAMIA SHARK

Squalus lamia Blainville, Faune Francaise, Poiss., 1820 : 88, pl. 22, fig. C (On Duhamel, Traite gen. Peches, 4, 1782-92 : 297, pl. 19 (type locality : Our seas).

Carcharhinus lamia, Khalaf, Mar. F. W. Fish. Iraq, 1961 : 11.
Carcharias lamia, Mahdi. Fish, Iraq., 1962 : 9
Local Names :- Kossetch ; Jar jur.

Snout blunt, very broad, its length in front of mouth about half the length of head in front of first gill opening. Corners of mouth with short labial folds. Nasal opening midway between mouth and tip of snout. Teeth subtriangular, all serrated. Origin of first dorsal opposite inner angle of the pectoral, its size large, its depth nearly as long as body depth. Second dorsal larger than anal, its origin before origin of anal. Precaudal pits present. Subcaudal lobe produced sharp. Greyish above, whitish below. Length reaches up to 150 cm.
Distribution :- Present in Shatt-al-Arab, Tigris and Euphrates, but due to constraction of irrigation dams on the last two rivers, the sharks rarely seen above the dams. Also present in the Arab Gulf, Arabian Sea, Indian Ocean, Pacific and Atlantic Oceans.

CARCHARHINUS LIMBATUS (MULLER AND HENLE)

BROWN SHARK

Fig. 9

Carcharias (priondon) limbatus Muller and Henle, Syst. Beschr. Plagiost,. 1841 : 49, pl. 19, fig. 9 (type locality : Martinique).
Local Names :- Kossetch; Jar jur; Krabi.

Snout elongated, pointed. Mouth large, strongly curved. Labial furrow at corner of mouth scarcely extending on to upper jaw. Nasal openings closer to mouth than to tip of snout. Teeth ereet, with narrow cusps and broad bases. Uppers with serrated bases and slightly serrated cusps, lowers with smooth cusps and serated bases. Origin of first dorsal above inner angle of pectoral. Second dorsal somewhat smaller than anal, its origin above origin of anal. Origin of ventral closer to origin of subcaudal than to origin of pectoral. Greenish grey above, paler below, first dorsal, pectoral and subcaudal with black tips. One specimen from the Arab Gulf, total length 46 cm.

Distribution :- The Arab Gulf where where a male of 81 cm. was captured by a fishing trawler in 1973 in Ras-al-Motaf. Also reported from the Arabian Sea, Red Sea, Indian Ocean and Atlantic Ocean.

CARCHARHINUS MENISORRAH (MULLER AND HENLE)

GREY - FINNED SHARK

Fig. 10

Carcharias (Prionodon) menisorrah Muller and Henle, Syst. Beschr. Plagiost., 1841 : 46, pls. 17, 19, fig. 7 type locality : Java ; Australia; Red Sea). - Blegvad, Danish Sci. Invest. Iran, pl. 3 , 1944 : 37, fig. 8, 10.- Mahdi, Fish. Iraq, 1962 : 9.

Carcharhinus menisorrah, Khalaf, Mar. F. W. Fish. Iraq, 1961 : 9. - Mazhar, Bull. Biol. Res. Centre, Baghdad Univ., 1966 : 46. - Kuronuma and Abe, Fish. Kuwait, 1972 : 43, Fig. 2.

Local Names :- Kossetch; Jar jur; Krabi.

Head in front of first gill opening about one-fourth body length to origin of subcaudal. Snout in front of mouth equal to width of mouth. Nostril a little closer to mouth than to tip of snout. Labial folds at angles of mouth short but with relatively longer extension on the upper jaw than lower. Teeth with broad bases, uppers triangular, outer edge notched and serrated basally; lower cusps narrow erect and smooth with broad bases. Width of pectoral about two thirds its length. First dorsal large, its origin above inner angle of pectoral, its upper angle sharp. Second dorsal and anal equal in size, their origin on one plane.

Precuadal pits present. Back grey, lower surface whitish, upper half of second dorsal deep black. Five specimens studied ranging in total length from 65 - 98 cm.

Distribution :- The most abundant shark in the Arab Gulf, ascends rivers, known from Shatt-al-Arab and Tigris. Spreading in the Arabian Sea, Red Sea and the Indian Ocean.

CARCHARHINUS SORRAH (MULLER AND HENLE)

SORRAH SHARK

Fig. 11

Carcharias (Prionodon) sorrah Muller and Henle, Syst. Bescher. Plagiost., 1841 : 45, pl. 16 (type locality :- India; Java; Madagascar).

Head length in front of first gill opening about one - fourth body length to origin of subcaudal. Snout length in front of mouth equal to distance between eye and first gill opening. Mouth strongly arched. Nostrils about midway from mouth to tip of snout. Corners of mouth without labial furrows. Teeth serrated, uppers triangular, with straight inner edges and notched outer edges, lowers narrow and more erect with broad bases. Pectoral falciform, its width more than half the length, outer angle sharp. Origin of first dorsal behind base of pectoral. Second dorsal very small about half the size of anal. Caudal pointed , its lower anterior lobe produced and pointed. Caudal peduncle with precaudal pits. Back grey, lower surface pale. Size small, not more than 80 cm. One specimen, B.N.H.M. No. 425, total lenpth 48.5 cm.

Distribution :- Rare in the Arab Gulf. Spreading in the Arabian Sea, Red Sea, Indian and Pacific Oceans.

CARCHARHINUS SPALLANZANI (LESUEUR)

BLACK - TIP SHARK

Squalus spallanzani LeSueur, Journ. Acad. Nat. Sci. Phila., 2 (2), 1822 : 351 (type locality : Terre de Witt, New Holland).

Carcharia melanopterus, Lane, Journ. Bombay Nat. Hist. Soc., 24, 1916 : 746.

Carcharhinus melanopterus, Tortonese, Bull. Mus. Zool. Anat. Comp. Univ. Torino, 3, 44, 1934 : 4 (Persia) .
Local Names :- Kossetch; **Jar jur.**

Snout short, very obtuse, its length in front of mouth equals to width of mouth. Nasal opening closer to tip of snout than to mouth . Labial folds restricted to corners of mouth, very short, with labial furrows above and below. Teeth erect, narrow, finely serrated. Pectorals falciform, outer angle sharp, inner rounded, its width less than half its length. Origin of first dorsal above inner angle of pectoral. Second dorsal opposite and similar to anal in size. Caudal less than 1/3 of the total length. Anterior lobe of subcaudal produced and pointed. Caudal peduncle with precaudal pits. Back brownish or grey, lower surface light, fins black edged. Length up to three meters.
Distribution :- Common in southern part of the Arab Gulf. Also in the Arabian Sea, Red Sea and Indian Ocean.

FAMILY SPHYRNIDAE

HAMMERHEAD SHARKS

Head produced laterally into a shape of hammer, with eyes at its outer margins. Mouth crescent-shaped. Labial folds rudimentary. Spiracles absent. Nictitating membrane well developed. Last gill opening above base of pectoral. Barbels absent. Oronasal lacking. Teeth alike on both jaws, compressed and oblique, with outer margins notched near bases. First dorsal above interspace between pectoral and ventral though nearer to pectoral. Second dorsal opposite anal. Development viviparous. One genus represented in the Arab Gulf.

GENUS SPHYRNA RAFINESQUE

Sphyrna Rafinesque, Indice Ittiol. Sicil., 1810 : 46, 60 (type **Squalus zygaena** Linnaeus). - Bigelow and Schroeder, Fish. W. N. Atl., 1948 : 408.

Head with moderate extension from each side. Eyes and nostrils closer to each other than midline of snout. Labial furrows either absent or present. First dorsal closer to pectoral than to ventral. Second dorsal much smaller than first. Anterior subcaudal lobe well produced. Subcaudal notch near the end of the caudal well developed. Other characteristics of the genus as for the family.

Key to species of genus **Sphyrna**

1 a. Anterior margin of head with concavities restricted to the area of nares **zygaena**
1 b. Anterior margin of head with five concavities **mokarran**

SPHYRNA MOKARRAN (RUPPELL)

SQUAT-HEADED HAMMERHEAD SHARK.

Zygaena mokarran Ruppell, Neue Wirbelth. Fische, 1835 : 66, pl. 17, fig. 3 (type locality : Massawa) .

Sphyrna tudes, Al-Daham, Bull. Basrah Nat. Hist. Mus., 1,1, 1974 : 105, fig. 3, 4.

Local Names :- Kossetch Abul-garn; Jar jur Abul-karn.

Head hammer-shaped, its anterior margin thin, tipped, with five concavities (one in the centre, one opposite each nostril and a large one between the central concavity and each nostril concavity). Width of lateral expansion near eye equal to length of its hind edge, about one-third of the total length of the lateral expansion. Front margin of the hammer with a weakly marked groove extending from edge of nostril half way to the midline. Snout length in front of mouth nearly equal to breadth of mouth. Teeth almost alike in both jaws except that the lowers are a little smaller than the uppers, their edges coarsely serrate. First dorsal origin over inner corner of pectoral. Second dorsal about half as long at base as first dorsal and nearly one-third as high. Caudal about one-third of total length, with well marked subterminal notch, anterior lobe of subcaudal well developed. Pectorals with weakly concave anterior and posterior margins. Caudal peduncle laterally compressed, upper precaudal pit yell marked, the lower hardly defined. Grey brown above, whitish below; second dorsal with black summit. Description prepared from a male specimen obtained by trawling in 1971, with total length of 85 cm, from northern sector of the Arab Gulf.

Distribution :- Rare in the Arab Gulf; nearly of world-wide distribution.

SPHYRNA ZYGAENA (LINNAEUS)

ROUND-HEADED HAMMERHEAD SHARK

Fig. 12

Squalus zygaena Linnaeus, Syst. Nat.. ed. 10, 1, 1758 : 234
(type locality : Europe; America).
Sphyrna zygaena White and Barwani, Comn. Sea Fish. Arab Gulf and Gulf of Oman, 1971 : 14.

Local Names :- Kossetch Abul-Garn; Jar jur Abul-Karn.

Head hammer-shaped. Hind margin of lateral expansion almost equal to its width but with concavities near nares only, anterior margin of lateral expansion with a furrow. Nares very close to eyes. Teeth alike in both jaws. inner margin of tooth nearly straight, outer margin notched and finely serrated. Origin of first dorsal posterior to end of base of pectoral, its height longer than its base. Base of second dorsal about half as long as base of anal fin, its origin opposite midpoint of anal fin. Length up to 3.8 meters. One specimen from the Arab Gulf of a total length of 47 cm.

Distribution :- The Arab Gulf, Arabian Sea, Indian Ocean and Atlantic Ocean.

ORDER RAJIFORMES

SKATES AND RAYS

Body typically disc-like in form, tail usually slender and thin. Pectoral fins extended anteriorly to combine with sides of head anterior to gill openings and posteriorly to meet with ventral fins. Anterior vertebrae united with each other to from a tube which support pectoral fins.

Five pairs of gill openings located entirely on the lower surface of the body. Spiracles large located on the upper surface near the eyes. Mouth transverse on the lowerssurface of the head. Nictitating membranes and upper eyelids are absent. Nostrils inferior. Teeth wide and flat, not blade-like. One or two dorsal fins, sometimes both absent. Anal fin absent. Caudal fin, if present, small. Precaudal pits absent. Skin either naked or armed with thorns, tubercles or prickles. Some with pair of electric organs located between each pectoral fin and the head. Fertilization internal. Development oviparous or ovoviviparous.

Key to suborders of order **Rajiformes**

1 a. With a caudal fin and two dorsal fins

2.a. Snout saw-shaped with toothlike structures from both sides
PRISTOIDEI

2 b. Snout not saw-shaped and not bearing toothlike structures on sides.

3 a. With two electric organs; skin naked
TORPEDINOIDEI

3 b. Without electric organs, skin not naked
RHINOBATOIDEI

1 b. Caudal fin absent; with one dorsal fin or without
MYLIOBATOIDEI

SUBORDER PRISTOIDEI

SAWFISHES

Head sharklike, with head and trunk ventrally flattened. Snout produced anteriorly forming a saw with toothlike structures on both sides. Mouth transverse. Spiracles large, behind eyes. Upper eyelid absent. Two large dorsal fins. Caudal fin well developed. Tail sector stout, precaudal pits absent. Oral teeth numerous. One family. They live near the bottom.

FAMILY PRISTIDAE

SAWFISHES

Characteristics of family as those of suborder. One genus.

GENUS PRISTIS LINK

Pristis Link, Mag. Physik. Naturgesch., Gotha, ser. 3, vol. 6, 1790 : 31 (type **Squalus pristis** Linnaeus) .- Bigelow and Schroeder, Fish. W. N. Atl., 1953 : 18.

Characteristics of genus as those of family. Represented by three species in the Arab Gulf.

Key to species of genus **Pristis**

1 a. Caudal fin with a distinct lower lobe.
    2 a. Origin of first dorsal posterior to origin of ventral, rostral teeth ranging from 23 to 35 pairs
    cuspidatus
    2 b. Origin of first dorsal anterior to origin of ventrals, rostral teeth ranging fom 17 to 21 pairs.
    microdon
1 b. Caudal fin without lower lobe
zijsron

PRISTIS CUSPIDATUS LATHAM

POINTED SAWFISH

Fig. 13

Pristis cuspidatus Latham, Trans. Linn. Soc. London, 2, 1794 : 279, pl. 26, fig. 3 (type locality : not known). - Blegvad, Danish Sci. Invest. Iran, pt. 3, 1944 : 45. - White and Barwani, Fish. Arab. Gulf and Gulf of Oman, 1, 1971 : 18

Local Names :- Kossetch Abu-Minshar; Abusef; Sayyafa.

Rostrum narrow and thin, tapering at end, its length about one - third of body length to origin of subcaudal fin. Rostral teeth 23 - 35 on either side. Oral teeth small, in many rows, in pavement.
Origin of first dorsal posterior to base of ventrals. Second dorsal a little

smaller than first. Caudal fin with well developed subcaudal lobe. Upper surface yellowish grey, lower surface whitish. Length up to six meters.

Distributions :- Common in the Arab Gulf near mouth of Shatt-al-Arab. Spreading in the Arabian Sea, Red Sea, Indian Ocean, Japan, and China.

PRISTIS MICRODON LATHAM

SMALL - TOOTHED SAWFISH

Fig. 14

Pristis microdon Latham, Trans. Linn. Soc. London, 2, 1794 : 280, pl. 26, fig. 4 (type locality : not known).

Local Names :- Kossetch Abu-Minshar; Abusef, Sayyafah.

Rostrum relatively wide, its length about one-third of body length to origin of subcaudal fin. Rostral teeth 17 - 22 on either side, short and widely spaced, present even near base of rostrum. Oral teeth in many rows, in pavement. Origin of first dorsal considerably anterior to origin of ventrals. Second dorsal almost equal to first, its origin in midpoint between posterior end of first dorsal and origin of subcaudal fin. Caudal fin with slightly produced lower lobe. Upper surface grey, lower dusky white. Length up to five feters.

Distribution :- Rare in the Arab Gulf. Spreading in the Arabian Sea , Indian Ocean and Tropical Atlantic.

PRISTIS ZIJSRON BLEEKER

GREEN SAWFISH

Fig. 15

Pristis zijsron Bleeker, Nat. Tijdschr.. Nederland, Indie, 2, 1851 : 417, 442 (type locality : Band jermassing, Boroneo in rivers) .

Pristis zysron, Blegvad, Danish Sci. Invest. Iran, pt. 3, 1944 : 45.- White and Barwani, Fish Arab. Gulf and Gulf of Oman, 1, 1971:18.

Local Names :- Kossetch Abu-minshar; Abusef; Sayyafah.

Rostrum not tapering at end, its length about one-third of body length to origin of subcaudal fin. Rostral teeth 25-32 on either side, present even near base of rostrum. Oral teeth in several rows in pavment. Origin of first dorsal posterior to mid - point of bases of ventrals . Dorsal fins almost equal in size. Subcaudal fin not forming a lobe. Upper surface greenish grey, lower whitish. Length up to six meters.
Distribution :- Rare in the Arab Gulf. Spreading in the Arabian Sea, Indian Ocean and Australia.

SUBORDER RHINOBATOIDEI

GUITAR FISHES

Body anterior to cloaca ranging from sharklike to raylike in form. Disc triangular, passing gradually into stout tail. Snout either pointed or broadly rouded, its edges without teeth. Spiracles very large, behind eyes. Two dorsal fins. Caudal fin well developed. Tail sector not marked off from trunk sector. Electric organs absent. No anal fin. Body and fins covered with small placoid scales of different shapes. Thorns often present on midline of back, on shoulders, around eyes and spiracles. Tail without serrated spines. Teeth small, numerous, in pavement . Development ovoviviparous. Two families. They live either close to the bottom or lie half buried in it.

Key to families of suborder **Rhinobatoidei**

1 a. Origin of first dorsal above or a little anterior to base of ventrals
RHYNCHOBATIDAE
1 b. Origin of first dorsal considerably posterior to base of ventrals
RHINOBATIDAE

FAMILY RHYNCHOBATIDAE

Snout either long and pointed or short and broadly rounded. Origin of first dorsal either above or a little anterior to ventral bases. Posterior margin of pectoral fin anterior to origin of ventrals. Caudal fin bilobed, its posterior margin deeply concave. Food composed mainly of crustaceans and molluscs. Two genera, both present in the Arab Gulf.

Key to genera of family **Rhynchobatidae**

1 a. Snout pointed .... **Rhynchobatus**

1 a. Snout broadly rounded .... **Rhina**

GENUS RHINA SCHNEIDER

Rhina Schneider in Bloch and Schneider, Syst. Ichth., 1801 : 352 (type : **Rhina ancylostomus** Bloch and Schneider).

Body depressed. Snout broadly rounded. Body anterior to cloaca almost as long as tail. Mouth anteriorly arched and strongly undulate. Nostrils either transverse or slightly oblique. Posterior margin of spiracle without ridges. Length of disc about one-third of total length. First dorsal fin opposite ventral fins. Lower lobe of caudal well developed.

One species.

RHINA ANCYLOSTOMA SCHNEIDER

BOW - MOUTHED GUITARFISH

Fig. 16

Rhina ancylostoma Schneider in Bloch and Schneider , Syst. Ichth. 1801 : 352, pl. 72)type locality : Indian Seas ; Coromandel).

Rhynchobatus ancylostomus, Blegvad, Danish Sci. Invest. Iran, pt. 3, 1944 : 47.

Local Names :- Kossetch mdawar al-fam; Nawwam.

Snout short and broadly rounded. Mouth strongly undulate and slightly arched anteriorly. Spiracle as large as eye, its posterior margin without ridges. Teeth obtusely rounded, with many ridges. Origin of first dorsal nearly opposite origin of ventrals. Second dorsal a little smaller than first, its origin midway between origin of first dorsal and origin of subcaudal. Caudal well developed, anterior lobe of subcaudal very distinct. Tail with longitudinal dermal ridge on each side. Head with a longitudinal row of tubercles above the eye and extending to shoulder on each side. Another row of tubercles on anterior part of midback, and two more short rows between each pectoral fin and the midback row. Upper surface redish brown, with several spots. Lower surface whitish. Length up to two meters.

Distribution :- Abundant in the Arab Gulf. Spreading in the Arabian Sea and Indian Ocean.

GENUS RHYNCHOBATUS MULLER AND HENLE

Rhynchobatus Muller and Henle, Sitzungsber. Akad. Wiss Berlin, 1837 : 116 (type : **Rhincobatus laevis** Schneider).

Disc subtriangular, its length more than its width. Mouth slightly undulate, with labial folds. Posterior margin of spiracle with two small ridges. Teeth obtusely rounded and not similar. First dorsal opposite ventrals. Second dorsal far away from first. Anterior lobe of subcaudal well developed. Origin of ventral far from base of pectoral. A single row of tubercles on middle of back between the dorsals and in front of the first. One species present in the Arab Gulf.

RHYNOCHOBATUS DJIDDENSIS (FORSSKAL)

WHITE - SPOTTED GUITARFISH

Fig. 17

Raja djiddensis Forsskal, Descript. Animal., 1775 : 18 (type locality : Djedda and Lohaja, Red Sea).

Rhynchobatus djiddensis, Blegvad, Danish Sci. Invest. Iran, pt. 3, 1944 : 47, Fig. 17. Mahdi, Iraq, Nat. Hist. Mus. Pub. 28, 1971 : 7, pl. 2, fig. 7. - Kuronuma and Abe, Fish Kuwait, 1972 : 44, fig.3.

Local Names :- Kossetch Abu-Misha ; Balando ; Nawwam.

Snout long, pointed. Disc subtriangular, its length more than its width. Labial folds prominant. Spiracle as large as eye, its posterior margin with two low ridges. Teeth blunt. First dorsal larger than second, its origin a little posterior to origin of ventrals. A single row or tubercles on midback, another short row on each shoulder, and a row extending between each spiracle and the orbit of eye. Tail with a lateral dermal ridge. Upper surface grey with several scattered white spots and round black spots on scapular region. Lower surface whitish. Length up to three meters. There are two specimens in our collection from the Arab Gulf, a male with the following description :- Total length = 1230 mm, disc width = 470 mm, snout length in front of eye = 190 mm, breadth of mouth = 82 mm, breadth of nostril = 57 mm, and a female with a total length of 450 mm, tail length = 235 mm, breadth of mouth = 31 mm, breadth of nostril = 25 mm.

Distribution :- Abundant in the Arab Gulf, inflecting heavy damage to crustaceans in coastal area of the Gulf. Spreading in the Arabian Sea, Red Sea, Malay Archipelago and Indo-China.

FAMILY RHINOBATIDAE

Shape of body intermediate between spindlelike and disclike. Body moderately or strongly depressed. Snout ranging from produced and pointed to short and rounded. Spiracle directly behind eye, its posterior margin sometimes with transverse ridges. Nostrils oblique. Anterior margin of pectoral fin either a little beyond nostril or to tip of snout, but its posterior margin extended at least to origin of ventrals. Origin of first dorsal considerably posterior to rear ends of ventrals. Subcaudal fin without defiite lobe. One genus in the Arab Gulf.

GENUS RHINOBATOS LINK

Rhinobatos Link, Mag. Phys. Naturg. Gotha, ser. 3, vol. 6, 1790 : 32 (type : **Raja rhinobatos** Linnaeus).

Snout produced, pointed. Trunk strongly depressed anteriorly. Spiracles large, its posterior margin with one or two dermal ridges. Nostril more or less oblique, its anterior margin with narrow lobe in the middle. Mouth transverse. Teeth numerous, rounded. Width of disc less than distance between tip of snout and cloaca. First dorsal fin considerably posterior to ventrals, similar to second dorsal in shape and equal to it in size. Caudal small, without distinct lower lobe. Tail flattened ventrally with lateral dermal ridge. Two species in the Arab Gulf.

Key to species of genus **Rhinobatos**

1 a. Internarial space almost equal to width of nostril **annulatos**

1 b. Internarial space about twice width of nostril **granulatus**

RHINOBATOS ANNULATOS MULLER AND HENLE

GREYISH SPOTTED GUITARFISH

Fig. 18

Rhinobatus (Syrrhina) annulatus Muller and Henle, syst. Beschr. Plagiost., 1841 : 116 (type locality : Cape of Good Hope).

Rhinobatus annulatus Mahdi, Iraq, Nat. Hist. Mus. Pub. 28, 1971 : 6, pl. 2, fig. 5.

Local Names :- Kossetch Abu-Misha ; Suss ; Nawwam.

Snout produced, pointed. Longitudinal rostral ridges converging from each other. Width of nostril equal to internarial space. Nostril with anterior large lobe extending beyond its posterior margin. Spiracle small, almost as large as eye, with two well developed folds. Small tubercles on middorsal, on orbital ridges, above spiracles, and on shoulder. The tubercles become less distinct with advancement in age. Upper surface yellowish grey with some rings of greyish colour, the largest smaller than eye. Lower surface whitish. One specimen in our collection with total length = 1327 mm, length of snout before eye = 295 mm, width of disc = 440 mm, width of mouth = 95 mm, width of nostril = 47 mm, internarial space = 42 mm.

Distribution :- Rare in the Arab Gulf. Spreading in eastern coast of South Africa.

RHINOBATOS GRANULATUS CUVIER

GRANULATED GUITARFISH

Fig. 19

Rhinobatus granulatus Cuvier ; Regne Animal, ed. 2, Vol. 2, 1829: 396 (No. locality). - Blegvad, Danish Sci. Invest. Iran, pt. 3, 1944 : 46, fig. 16 - Mahdi, Iraq Nat. Hist. Mus. Pub. 28, 1971 : 6, pl. 2, fig. 4.

Local Names :- Kossetch Abu-Misha ; Balando ; Nawwam.

Snout produced, pointed. Longitudinal rostral ridges approaching each other at their posterior half. Nostril large, wide, oblique at posterior end, its width about twice internarial space. Spiracle small immediately behind eye, its posterior margin with two small dermal ridges. A row of large tubercles (19-30) on middorsal before first dorsal fin, another row of small tubercles between first and second dorsal. Large tubercles on shoulders. Upper surface yellowish grey. Lower surface whitish up to two meters. Feeding on crustaceans molluscs, and small fishes where a heavy damage inflected because of such feeding.

Distribution :- Abundant in the Arab Gulf. Spreading in the Arabian Sea. Indian Ocean and Pacific Ocean.

SUBORDER TORPEDINOIDEI

ELECTRIC RAYS

Head, trunk and pectoral fins forming a depressed circular or subcircular disc. Edges of disc thicker than other suborders. Snout short and obtuse. Mouth either small or medium. Nostrils very close to mouth. Eyes small in the majority, sometimes rudimentary or absent. Spiracles large near eyes. Gill opening small. Two electric organs between pectoral fins. Anterior edge of pecoral attached to head before eyes. One or two dorsal fins, sometimes none. Caudal well developed. Tail sector of body short and relatively stout, sometimes with lateral folds. Teeth small, smooth, or with sharp ridges. Skin naked. Their food composed of crustaceans, molluscs and other bottom organisms.

Development ovoviviparous. They live in tropical, subtropical and temperate seas and oceans. Three families, one of them in the Arab Gulf.

FAMILY TORPEDINIDAE

ELECTRIC RAYS

Disc ranging from elongate to circular. Skin naked, soft, without scales, tubercles or thorns. Nostrils separated from mouth. Eyes either absent or well developed. Two dosal fins. Two large electric organs. Ventral fins large, close to pectoral. Caudal of medium size. Two genera in the Arab Gulf.

Key to genera of family **Torpedinidae**

1 a. Tail only slightly shorter than disc, origin of first dorsal posterior to bases of ventrals

Narcine

1 b. Tail much shorter than disc, origin of first dorsal above bases of ventrals.

Torpedo

GENUS TORPEDO HOUTTUYN

Torpedo Houttuyn, Nat. Hist. Linn., 1764 : 453 (type : **Raja torpedo** Linnaeus). - Bigelow and Schroeder, Fish. W. N. Atl., 1953 : 90.

Snout short, as long as interorbital space. Eyes well developed. Spiracles of medium size, their posterior edges sometimes with papillae. Nostril either transverse or slightly oblique, closer to mouth than to tip of snout. Nasal curtain a little broader than long. Teeth in rows not extending to corners of mouth. Disc boader than long. Base of first dorsal either entirely or party above bases of ventrals. Second dorsal a little smaller than first. Tail very short, with a low lateral fold. Skin soft. Two species in the Arab Gulf.

Key to species of genus **Torpedo**

1 a. End of base of first dorsal either exactly above end of bases of ventrals or anterior to them.

marmorata

1 b. End of base of first dorsal posterior to ends of bases of ventrals. **sinus-persici**

TORPEDO MARMORATA OLFERS

VERMICULATE TORPEDO RAY

Torpedo mararata var. **panthera** Olfers, Torpedo, 1831 : 16 (type locality : Red Sea).

Torpedo panthera, Blegvad, Danish Sci. Invest. Iran, pt. 3, 1944 : 44, pl. 3.
Local Names :- Lokma ; Fitra ; Awala.

Disc subcircular, broader than long. Snout short, its anterior margin nearly straight. Eyes well developed, though small. Spircles as large as eyes, their posterior margins with papillae, ranging from seven to nine. First dorsal slightly larger than second, the end of its base either above or anterior to end of bases of ventrals. Distance between first dorsal and second equal to distance between second dorsal and caudal. Length of tail sector about one-third of total length. Each side of tail with a longitudinal dermal fold. Teeth small with wide bases. They live on bottom. The voltage of electric organ in large animals exceeds 100. Upper surface light brown with numerous irregular deep brown spots or stripes, lower surface whitish.

There are several specimens in our collection from the Arab Gulf. One of them has the following measurments : Total length = 350 mm; tail length = 135 mm ; disc length = 200 mm ; disc width = 240 mm.
Distribution :- Relatively abundant in the Arab Gulf, spreading also in the Arabian Sea and Red Sea.

TORPEDO SINUS - PERSICI OLFERS

Fig. 20

Torpedo sinus persici Olfers, Torpedo, 1831 : 15, 17 (on Kampfer).

Narcacion sinus persici, Garman, Mem. Harv. Comp. Zool. 36, 1913: 309 (Persian Gulf).
Local Names :- Lokma ; Fitra ; Awala.

Snout short, obtuse. Eyes smaller than spiracles ; Posterior margin of spiracle with seven to nine papillae. Teeth small. First dorsal slightly larger than second, end of its base noticeably, posterior to ends of bases of ventrals. Length of tail sector about 3/7 total length. Skin soft. Upper surface pale brown with large black spots, lower surface whitish.

One specimen (total length = 135 mm) obtained in 1972 from southern section of the Arab Gulf.
Distribution :- Not common in the Arab Gulf. Spreading in the Arabian Sea and Red Sea.

GENUS NARCINE HENLE

Narcine Henle, Uber Narcine, Berlin, 1834 : 31 (type : **Torpedo brasilinensis** Olfers). - Fowler, Bull, U. S. Nat. Mus., 100, vol. 13, 1941 : 332.

Snout twice as long as interorbital space, with broad anterior margin. Spiracles large, their posterior margins sometimes with papillae. Mouth narrow, transverse and almost straight, Nasal curtain much broader than long. Teeth not extending to corners of mouth. Origin of first dorsal posterior to ventral fins. Tail slightly shorter than disc, with longitudinal lateral fold. Caudal well developed. Skin smooth. One species is encountered in the Arab Gulf.

NARCINE TIMLEI (SCHNEIDER)

SPOTTED ELECTRIC RAY

Raja timlei Schneider in Bloch and Schneider, Syst. Ichth, 1801:359 (type locality : Tranquebar ; Madras).

Local Names :- Lokma ; Fitra ; Awala.

Snout short, blunt. Disc subcircular, its width slightly more than its length. Mouth small and straight. Eyes small. Spiracles larger than eyes, located directly behind them and without papillae. Origin of first dorsal posterior to ends of bases of ventrals in a short distance.

Origin of second dorsal closer to origin of first dorsal than to origin of caudal. Tail only slightly shorter than disc. Skin soft. Upper surface brown with scattered darker spots, lower surface whitish. Two specimens obtained in 1972 by trawling near Ras Al-Motaf.

Distribution :- Very rare in the Arab Gulf, spreading in the Arabian Sea and Indian Ocean.

SUBORDER MYLIOBATOIDEI

Cranium without rostral projection. Head and anterior part of trunk strongly depressed. Eyes and spiracles either lateral or dorsal. Disc ranging from oval to very wide. Teeth ranging from numerous and small to few and large. Pectoral fins either united anterior to head, or with parts completely separated from the main body of the fin, forming one or two cephalic fins. Tail sector well destinguished from trunk, either shorter than disc or much longer. Upper surface with tubercles or thorns, lower surface almost naked. Development ovoviviparous . They live in tropical and subtropical seas and oceans (Bigelow and Schroeder, 1953 : 331-333). Five families can be encountered in the Arab Gulf.

Key to families of suborder **Myliobatoidei**

1 a. Without any cephalic fin, eyes on dorsal surface of head.
    2 a. Disc not more than 1.3 times as broad as long, tail not shorter than rest of body.
        DASYATIDAE
    2 b. Disc more than 1.5 times as broad as long, tail shorter than rest of body.
        GYMNURIDAE
1 b. With one or two cephalic fins, eyes lateral.
    3 a. With one cephalic fin
        MYLIOBATIDAE
    3 b. With two cephalic fins.
        4 a. Cephalic fins united at their bases
            RHINOPTERIDAE
        4 b. Cephalic fins well separated from each other
            MOBULIDAE

FAMILY DASYATIDAE

STING RAYS

Pectoral fins united anterior to head. No cephalic fin or fins. No rostral projection. Disc not more than 1.3 times as broad as long. Mouth either straight or slightly arched. Floor of mouth with a row of fleshy papillae. Eyes and spiracles on dorsal surface of head. Nostril separated from mouth, its anterior edge with more or less fringed curtain. No dorsal fins or caudal. Tail narrow and well marked off from trunk, much longer than disc and tapering at end. Upper surface of tail with one serrated spine or more. Upper surface of disc either smooth or with tubercles and thorns (Bigelow and Schroeder, 1953 : 331-335). Very dangerous to bathers because of their spines. They feed on crustaceans and other invertebrates. Two genera in the Arab Gulf.

Key to genera of family **Dasyatidae**

1 a. Lower surface of tail posterior to spine with a longitudinal dermal fold.

Dasyatis

1 b. Lower surface of tail posterior to spine without a longitudinal dermal fold.

Himantura

GENUS DASYATIS RAFINESQUE

Dasyatis Rafinesque, Carratt. Nuov. Gen. Spec. Sicilia, 1810 : 48 (type : **Dasyatis ujo** Rafinesque), - Bigelow and Schroeder, Fish. W.N. Atl., 1953 : 340.

Disc oval or rhomboidal, either soft or with thorns and tubercles. Tail whiplike, much longer than disc, with one long pointed and serrated spine or more on upper surface, and well developed longitudinal dermal fold on lower surface, starting just posterior to the spine ; upper surface posterior to spine either with a longitudinal low fold or ridge or without. Spiracles large, behind eyes. Nostril slightly oblique. Teeth either flat or with median ridges. Alltogether about thirty species are known, three in the Arab Gulf.

FAMILY DASYATIDAE

STING RAYS

Pectoral fins united anterior to head. No cephalic fin or fins. No rostral projection. Disc not more than 1.3 times as broad as long. Mouth either straight or slightly arched. Floor of mouth with a row of fleshy papillae. Eyes and spiracles on dorsal surface of head. Nostril separated from mouth, its anterior edge with more or less fringed curtain. No dorsal fins or caudal. Tail narrow and well marked off from trunk, much longer than disc and tapering at end. Upper surface of tail with one serrated spine or more. Upper surface of disc either smooth or with tubercles and thorns (Bigelow and Schroeder, 1953 : 331-335). Very dangerous to bathers because of their spines. They feed on crustaceans and other invertebrates. Two genera in the Arab Gulf.

Key to genera of family **Dasyatidae**

1 a. Lower surface of tail posterior to spine with a longitudinal dermal fold.

Dasyatis

1 b. Lower surface of tail posterior to spine without a longitudinal dermal fold.

Himantura

GENUS DASYATIS RAFINESQUE

Dasyatis Rafinesque, Carratt. Nuov. Gen. Spec. Sicilia, 1810 : 48 (type : **Dasyatis ujo** Rafinesque), - Bigelow and Schroeder, Fish. W.N. Atl., 1953 : 340.

Disc oval or rhomboidal, either soft or with thorns and tubercles. Tail whiplike, much longer than disc, with one long pointed and serrated spine or more on upper surface, and well developed longitudinal dermal fold on lower surface, starting just posterior to the spine ; upper surface posterior to spine either with a longitudinal low fold or ridge or without. Spiracles large, behind eyes. Nostril slightly oblique. Teeth either flat or with median ridges. Alltogether about thirty species are known, three in the Arab Gulf.

Key to species of genus **Dasyatis**

1 a. Dermal fold both above and below.
  2 a. Tail almost as long as disc, floor of mouth with two papillae.

imbricatus

  2 b. Tail about twice length of disc, no buccal papillae.

zugei

1 b. Dermal fold on tail below, not above.

sephen

DASYATIS IMBRICATUS (SCHNEIDER)

SCALY STING RAY

Raja imbricata Schneider in Bloch and Schneider, Syst. Ichth., 1801 : 366 (type locality : Coromandel).
Local Names :- Lokma ; Shurus.

Snout produced, pointed. Mouth slightly undulate, its floor with two fleshy papillae. Spiracles as large as eye and posterior to it. Teeth in several rows. Disc as broad as long. Tail almost as long as rest of the body, with one pointed and serrated spine, followed by a longitudinal dermal fold both above and below. Body covered with small tubercles on back and top of head. Tail with large and small tubercles before the spine. A row of thorns on back and shoulder.
Body colour above reddish brown, below whitish.
Distribution :- Very rare in the Arab Gulf, spreading in Arabian Sea, Red Sea and Indian Ocean.

DASYATIS SEPHEN (FORSSKAL)

COW - TAIL RAY

Fig. 22

Raja sephen Forsskal, Descript. Animal., 1775 : 17 (type locality : Djedda, Lohaja, Red Sea).

Hypolophus sephen, Blegvad, Danish Sci. Invest. Iran, pt. 3, 1944 : 51.

Dasybatus sephen, White and Barwani, Fish. Arab Gulf, and Gulf of Oman, 1, 1971 : 21.

Local Names :- Lokma; Shurus.

Snout obtuse. Disc rhomboidal, broader than long. Mouth undulate, its floor with five papillae, the median three closer to each othe and longer. Spiracles about twice as large as eyes. Tail about thre times as long as disc or more; its upper surface with one serrated spin or two but without longitudinal dermal fold or ridge, its lower surface with a longitudinal dermal fold. Skin smooth when young, as the advance in age, tubercles start to cover top of head, midback and anterior part of tail. Two or three large oval tubercles always present o middorsal. Upper surface brown, lower white.

Distribution :- Abundant in entrance of Shatt-al-Arab and differen parts of the Arab Gulf. Spreading in the Arabian Sea, Red Sea, Sout Africa and Malay Archipelago.

DASYATIS ZUGEI (MULLER AND HENLE)

STELLATE STING RAY

Fig. 23

Trygon zugei Muller and Henle, Syst. Beschr. Plagiost., 1841 : 165, pl. 54 (type locality : Japan : China; India).

Local Names :- Lokma; Shurus.

Snout well produced, narrow and pointed, sharper than any species of this genus. Disc rhomboidal, as broad as long or slightly more. Mouth undulate, its floor without papillae, its width as long as distance between nostrils. Spiracles little larger than eyes. Tail twice as long as disc. Dermal folds both above and below, upper fold very low and much shorter than lower. Well developed serrated spine on tail, proceeded by two rows of small thorns. Skin smooth when young, as they advance in age tubercles start to appear on back. Large tubercles sometimes forming a row on midback. Upper surface either brown or yellowish brown, lower whitish.

Disribution :- Rare in the Arab Gulf. Spreading in the Arabian Sea, Malay Archipelago, China and Japan.

GENUS HIMANTURA (MULLER AND HENLE)

Himantura Muller and Henle, Arch. Naturg. 1, 1837 : 400 (type : **Raja uarnak** Forsskal). - Bigelow and Schroeder, Fish. N. W. Atl., 1953 : 389.

Disc oval or rhomboidal, either soft or with tubercles and thorns. Tail much longer than disc, with one serrated spine or more on upper surface and without any dermal fold or ridge on upper or lower surface of tail.

Characters otherwise as of **Dasyatis** Rafinesque. Four species encountered in the Arab Gulf.

Key to species of genus **Himantura**

1 a. Floor of mouth with two papillae.
  2 a. Tail only slightly longer than disc **walga**
  2 b. Tail about 3 times as long as disc **bleekeri**
1 b. Floor of mouth with four papillae or more.
  3 a. Tail about 2.5 times as long as disc **uarnak**
  3 b. Tail about 3.5 times as long as disc **gerrardi**

HIMANTURA BLEEKERI (BLYTH)

BLEEKER'S STING RAY

Fig. 24

Trigon bleekeri Blyth, Journ. Asiat. Soc. Bengal, 29, 1860 : 41 (type locality : Bengal).

Local Names :- Lokma ; Shurus.

Snout produced narrow and pointed. Disc subrhomboidal, nearly as long as broad. Tail about three times as long as disc or more, with one serrated spine. Mouth strongly undulate, with two fleshy papillae, each of them closer to the other than to corner of mouth. A large tubercle on middorsal with three smaller tubercles anterior and three posterior to it. Tail in front of the serrated spine, sometimes with tubercles. Uuuer surface dark brown without spots, lower whiitsh. Tail without rings.

One specimen (male) in the collection of Basrah Natural History Museum from the Arab Gulf of the following measurements : Disc length = 185 mm, Disc width = 200 mm, Tail length = 595 mm.
Distribution :- Rare in the Arab Gulf, spreading between Arabian Sea and China.

HIMANTURA GERRARDI (GRAY)

GERRARD'S STING RAY

Fig. 25

Trygon gerrardi Gray, List Fish. Brit. Mus., 1851: 116 (type locality: India). - Blegvad, Danish Sci. Invest. Iran, pt. 3, 1944 : 50, fig. 19, pl. 2, figs. 2, 2a.

Dasyatis gerrardi, Mazhar. Bull. Biol. Res. Centre, Baghdad, 2, 1966: 49, 56, fig. 6.

Local Names :- Lokma ; Shurus.

Snout obtuse, not produced. Disc subtriangular, broader than long, its anterior margin undulate. Tail long, about three times as long as disc or more, with one serrated spine. Mouth undulate with four fleshy papillae on its floor. Spiracle about as large as eye and directly posterior to it. Youngs with soft skin, as they advance in age, a large tubercle appears on middorsal and several irregular rows of tubercles appear anterior and posterior to it. Upper surface brown when young, as they advance in age, spots of yellow colour appear on posterior part of body and black and white narrow rings on tail. Lower surface white.

Distribution :- Very abundant in the Arab Gulf. Spreading in Arabian Sea, Red Sea and Indian Ocean.

HIMANTURA UARNAK (FORSSKAL)

BANDED WHIPTAIL STING RAY.

Fig. 26

Raja uarnak Forsskal, Descript. Animal., 1775 : 18 (type locality : Arabia).

Trygon uarnak, Blegvad, Danish Sci. Invest. Iran, pt. 3, 1944 : 48. pl. 2, fig. 1.

Dasyatis uarnak, Mazhar, Bull. Biol. Res. Centre, Baghdad, 2, 1966: 49. - White and Barwani, Fish. Arab. Gulf and Gulf of Oman, 1, 1971 : 20.

Himantura uarnak, Mahdi, Iraq Nat. Hist. Mus. Pub. 28, 1971 : 7.

Local Names :- Lokma ; Shurus ; Abu-Sarreiha ; Marna.

Snout slightly produced and pointed. Disc rhomboidal almost as broad as long. Tail about three times as long as disc, with one serrated spine. Mouth undulate, with four to seven papillae in its floor. Spiracle slightly larger than eye, its margin not fringed. Youngs with smooth skin, as they advance in age, tubercles appear on head, trunk and tail. Mid-dorsal of disc with large white tubercle, surrounded by small tubercles, forming rhomboidal shape. They change their colour as they advasce in age. Upper surface brown with small darker spots, lower white. Tail with brown spots anteriorly and cross bands posteriorly. Spots on disc and bands on tail disappear with advancement in age. There is one male specimen in our collection from the Arab Gulf with the following measurements: Total length = 87 cm, tail length=66 cm, Disc length = 22.5 cm, Disc width = 23.5 cm.

Disribution :- Abundant in different parts of the Arab Gulf.

Spreading in Arabian Sea, Red Sea and Malay Archipelago,

HIMANTURA WALGA (MULLER AND HENLE)

WALGA STING RAY

Fig. 27

Trygon walga Muller and Henle, Syst. Beschr. Plagiost., 1841 : 159, pl. 51, fig. 1 (type locality : India ; Red Sea) .

Dasyatis walga, Mazhar, Bull. Biol. Res. Centre, Baghdad, 2, 1966: 47, 54.

Local Names :- Lokma ; Shurus.

Snout produced, pointed. Disc rhomboidal, as long as broad or slightly more. Tail a little longer than disc, with one or two serrated spines but without any longitudinal fold. Mouth small, undulate, with two fleshy papillae on its floor. Spiracle as large as eye, directly posterior to it. Disc free from tubercles except one row extending from an area close to eyes until origin of the serrated spine, and several other tubercles behind the latter. Upper surface brown, lower white. Length up to 52 cm. One specimen in the collection of Basrah Natural History Museum (No. 407) of the following measurements : Total length = 46.5 cm. Tail length = 21.5 cm. Disc length = 22 cm. Disc width = 21 cm.

Distribution :- The Arab Gulf, Arabian Sea, and Red Sea.

FAMILY GYMNURIDAE

BUTTERFLY RAYS

Disc very wide, more than 1.5 times as broad as long. Tail shorter than rest of body, with one or two serrated spines or none. A small dorsal fin sometimes present on midlength of tail. Floor of mouth without papillae. Characters otherwise as in Dasyatidae.

One genus in the Arabian Gulf.

GENUS GYMNURA VAN HASSELT

Gymnura van Hasselt, Alg. Konst. en Letterbode Haarlem, 1823 : 316 (cited from : Bigelow and Schroeder, 1953 : 396).

Disc much broader than long, with rounded angles. Dorsal fin absent. Tail as long as disc or much shorter. Serrated spine either present or absent. Mouth large, either transverse or a little arched. Spiracle large, directly behind eye, with or without tenticles. Eyes small, prominent. One species in the Arab Gulf.

GYMNURA POECILURA (SHAW)

SPOTTED BUTTERFLY RAY

Fig. 28

Raja poecilura Shaw, General Zoology, 5, 1804 : 281 (on Tenkee Kunsal Russell, Fish. Coromandel, 1, 1803 : 4, pl. 6 (type locality : Vizagapatam).

Pteroplatea poecilura, Blegvad, Danish Sci. Inves. Iran, pt. 3, 1944 : 52, fig. 21. - White and Barwani, Comm. Sea Fish. Arab. Gulf and Gulf of Oman, 1, 1971 : 22.

Local Names :- Lokma.

Disc subrhomboidal, about twice as broad as long. Snout obtuse, with small produced process. No dorsal fin. Tail about as long as disc, without a serrated spine and without a longitudinal dermal fold. Tubercles absent. Upper surface brown, lower white. Tail annulated with white and brown, ranging from nine to eleven. Several specimens in the collection of Basrah Natural History Museum from the Arab Gulf, of these two males of the following measurements :- Total length = 18.5, 44.5 cm, tail length = 7.0, 20.0 cm, disc length = 12.3, 27.0 cm, disc width = 24.3, 51.2 cm.

Distribution :- Abundant in the Arab Gulf. Spreading in Arabian Sea, Red Sea, Indo-China and China.

FAMILY MYLIOBATIDAE

EAGLE RAYS

Pectorals either narrow, opposite eyes or entirely disappear there then reappear at the tip of snout and unite to form a cephalic fin. Eyes and spiracles lateral. Mouth with transverse curtain on its roof and several papillae on its floor. Teeth large, flat and pavement-like, in one to seven series on each jaw. Tail narrow, whip-like, much longer than disc, sometimes with one serrated spine or more. One dorsal fin on anterior part of tail but no caudal fin, or any dermal fold. Skin naked except a serrated spine or spines, some tubercles around orbit on mid-dorsal are seen on males (Bigelow and Schroeder, 1953 : 433). Two genera in the Arab Gulf.

Key to genera of family **Myliobatidae**

1 a. Teeth in one series on each jaw, tail with a serrated spine
Aetobatus

1 b. Teeth normally in seven series, no serrated cacdal spine
Aetomyleus

GENUS AETOMYLEUS GARMAN

Aetomylaeus Garman, Bull. Mus. Comp. Zool. Harvard, 51, 1908 : 252 (type **Myliobatis maculatus** Gray).

Disc about twice as broad as long or less, rhomboidal. Tail narrow, whip-like, much longer than disc, and without any serrated spine. Dorsal fin opposite end of bases of ventrals or posterior to them. Teeth in seven series, one central series of large teeth, and three other series of narrow teeth on each side. Skin either smooth or with small thorns and tubercles on middorsal. Two species in the Arab Gulf.

Key to species of genus **Aetomyleus**

1 a. Origin or dorsal posterior to end of bases of ventrals, disc less than twice as broad as long
maculatus

1 b. Origin of dorsal opposite end of bases of ventrals, disc twice as broad as long
nichofii

AETOMYLEUS MACULATUS (GRAY)

MOTTLED EAGLE RAY

Myliobatis maculatus Gray, Illustr. Indian Zool., Hardwicke, 2, 1834: 101. - Blegvad, Danish Sci. Invest. Iran, pt. 3, 1944 : 55.

Local Names :- Lokma ; Gharabi.

Disc less than twice as broad as long. Pectoral fin as long as wide, anterior margin convex, posterior concave. Origin of dorsal behind ends of bases of ventrals. Tail more than four times as long as the body, without a serrated spine. Skin rough with small tubercles or thorns (Garman, 1913 : 435). Upper surface brown with light round spots, margin of disc dark posteriorly, lower surface white. Tail of uniform colour. Length up to 72 cm.

Distribution :- Arab Gulf, Arabian Sea, Indian and Pacific Oceans.

AETOMYLEUS NICHOFII (SCHNEIDER)

NIEUHOF'S EAGLE RAY

Fig. 29

Raja nichofii Schneider in Bloch and Schneider, Syst. Ichth., 1801 : 364 (On Zeevleermuis Nieuhof, Gedenk. Reize. 1, 1682 : 278).

Myliobatus nichofii, Blegvad, Danish Sci. Invest. Iran, pt. 3, 1944 : 54. - White and Barwani, Comm. Sea Fish. Arab Gulf and Gulf of Oman, 1, 1971 : 24.

Aetomyleus nichofii,Kuronuma and Abe, Fish, Kuwait, 1972 : 46, pl.1.
Local Names :- Lokma ; Gharabi.

Disc about twice as broad as long. Pectoral width a little more than its length, its anterior margin almost straight, its posterior margin concave. Tail about three times as long as disc, without serrated spine. Skin smooth when young, as they advance in age, it becomes rough. Upper surface dark brown, sometimes with irregular dark and light spots, lower white.

Distribution :- The Arab Gulf, Arabian Sea, Red Sea, Malay Archipelago, Australia, China and Japan.

GENUS AETOBATUS BLAINVILLE

Aetobatus Blainville, Bull. Soc. Philom. 8, 1816 : 122 (type : **Raja Narinari** Euphrasen). - Bigelow and Schroeder, Fish. W. N. Atl., 1953 : 451.

Disc rhomboidal, about twice as broad as long. Floor of mouth with a row of papillae from two to four. Teeth formed of a single series of broad plates on each jaw. Tail much longer than disc, with or without a serrated spine. A small dorsal fin on base of tail. One species enters the Arab Gulf.

AETOBATUS FLAGELLUM (SCHNEIDER)

GREY EAGLE RAY

Raja flagellum Schneider in Bloch and Schneider, Syst. Ichth., 1801: 361, pl. 73 (type locality : Coromandel).
Aetobatus narinari, Blegvad, Danish Sci. Invest. Iran, pt. 3, 1944 : 55.
Stoasodon narinari, White and Barwani, Comm. Sea Fish. Arab Gulf and Gulf of Oman, 1, 1971 : 23.
Local Names :- Lokma ; Gharabi ; Tess.

Disc rhomboidal; its width less than twice its length. Cephalic fin straight and pointed. Mouth a little arched. Teeth in a single series, flat and broad. Dorsal fin arises at base of ventral fins. Tail very long ranging from three to four times as long as disc, with one serrated spine or two, posterior to dorsal fin. Upper surface grey, lower whitish. In **A. narinari** (Euphrasen) of tropical Atlantic and eastern Pacific, the upper surface of disc and ventrals is spotted. Fowler (1941) regards **A. flagellum** as a synonym of **A. narinari.**
Distribution :- The Arab Gulf, Arabian Sea, Red Sea and Indian Ocean.

FAMILY RHINOPTERIDAE

COW - NOSED RAYS

Two cephalic fins united at their bases only, separated completely from the main body of pectoral fins, and located at the same level of lower surface of head. Upper surface of head with a longitudinal notch. Floor and roof of mouth without papillae. Eyes prominent and lateral. Spiracles large, lateral, behind eyes. Teeth in several series, broad flat and pavement-like. Disc rhomboidal. Tail long and narrow, carrying a dorsal fin and a serrated spine. One genus of worldwide distribution.

GENUS RHINOPTERA CUVIER

Rhinoptera Cuvier, Regne Animal, 2, ed. 2. 1829 : 401 (Type : **Myliobatis marginata** Geoffroy Saint-Hilaire).

Disc rhomboidal, about twice as broad as long or less. Tail long, narrow, its base with a dorsal fin followed by a serrated spine. Teeth

GENUS MOBULA RAFINESQUE

Mobula Rafinesque, Indice d'Ittiol. Siciliana, 1810 : 48, 61 (type : **Mobula auriculata** Rafinesque). - Bigelow and Schroeder, Fish. W.N.Atl., 1953 : 486.

Disc rhomboidal, about twice as broad as long. Mouth on lower surface. Teeth on both jaws. Cephalic fins thin and leaflike. One dorsal fin. No caudal fin. Tail short and whiplike. One species in the Arab Gulf.

MOBULA DIABOLUS (SHAW)

LESSER DEVIL RAY

Fig. 31

Raja diabolus Shaw, General Zoology, 5, 1804 : 291 (on Eregoodootenkee Russel, Fish. Coromandel, 1, 1803 : 5, pl. 9 (type locality : Vizagapatam).

Local Names :- Firs ; Lokma.

Disc rhomboidal, about twice as broad as long. Two undulate cephalic fins used to draw food into mouth. One dorsal fin. No serrated spine. Teeth small, in several series. Skin soft. Upper surface dark grey, lower white.

Distribution :- The Arab Gulf, Arabian Sea, Red Sea and Malay Archipelago.

GENUS MANTA BANCROFT

Manta Bancroft, Zool. Journ., 4, 1829 : 144 (type: **Cephalopterus manta** Bancroft).

Disc rhomboidal, about twice as broad as long. Mouth terminal. Tail whiplike, about as long as disc, with or without a serrated spine. Teeth only on lower jaw. One dorsal fin. One species in the Arab Gulf.

MANTA EHRENBERGII (MULLER AND HENLE)

Manta

Fig. 32

Ceratoptera ehrenbergii Muller and Henle, Syst. Sechr. Plagiost., 1841 : 187 (type locality : Red Sea).

Local Names :- Firs.

Disc about twice as broad as long. Cephalic fins produced anteriorly. Tail as long as bdoy including cephalic fins. Mouth broad, terminal. Teeth small, in several series extending over whole width of lower jaw. Spiracle smaller than eye. Skin rough. Upper surface purple, lower white. Width of disc upto five meters. One specimen obtained in 1972 by trawling near Ras-al-Motaf.

Distribution :- The Arab Gulf ; Arabian Sea, Red Sea and South Africa.

SUMMARY

The present paper is an abbreviated descriptive account of the cartilaginous fishes of Iraq and the Arab Gulf.

A total of 15 species of sharks (Order squaliformes) comprising five families and nine genera ; and 24 species of rays and skates (Order Rajiformes) comprising nine families and 14 genera are presented.

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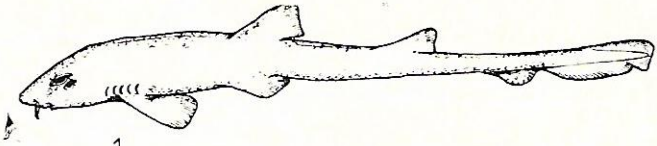
الخلاصة

يحتوى البحث على وصف موجز للاسماك الغضروفية فى العراق والخليج العربى ويشتمل على ١٥ نوعا من رتبة القرشيات موزعة بين خمس عوائل وتسعة اجناس وعلى ٢٤ نوعا من رتبة القوبعيات موزعة بين تسع عوائل و١٤ جنسا .



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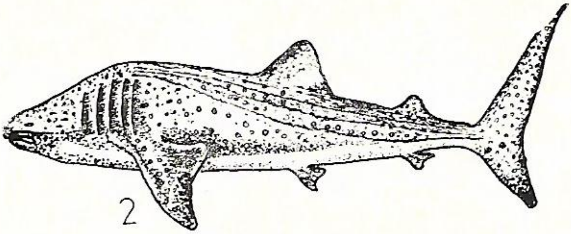

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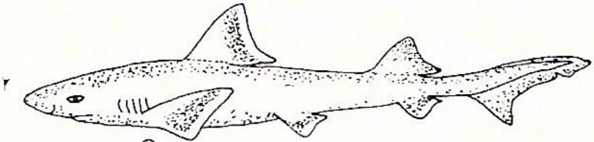

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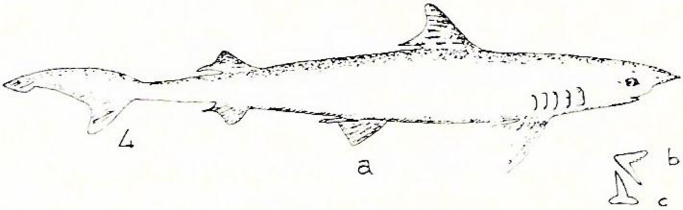
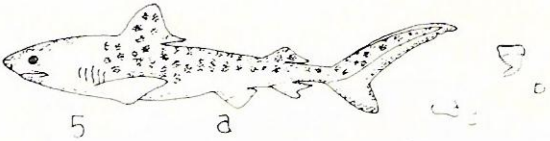
Fig. 1. **Hemiscyllium griseum** (Muller & Henle).

Fig. 2. **Rhincodon typus** Smith (After Bigelow & Schroeder).

Fig. 3. **Mustelus manazo** Bleeker (After Fowler).





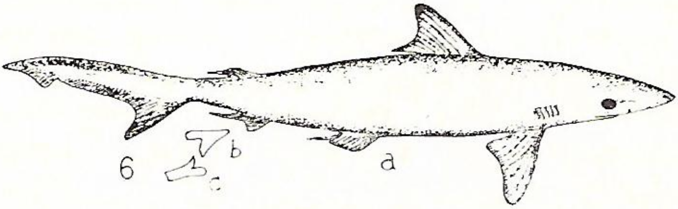
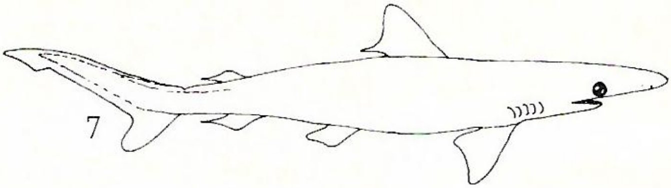
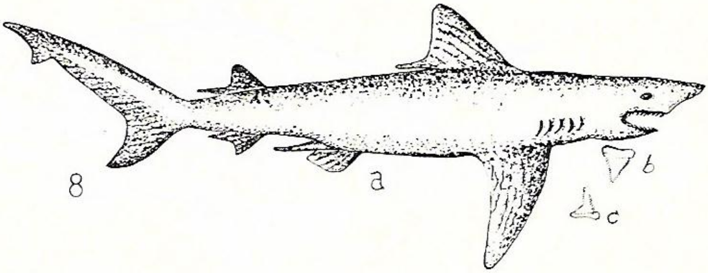


Fig. 4. (a) **Hemigaleus balfouri** Day (After Day), lateral tooth of (b) upper and (c) lower jaws.

Fig. 5. (a) **Galeocerdo cuvieri** (Le Sueur) (After Fowler) , lateral tooth of (b) upper jaw and (c) lower jaws.

Fig. 6. (a) **Scoliodon walbeehmi** Bleeker (After Day), lateral tooth of (b) upper and (c) lower jaws.





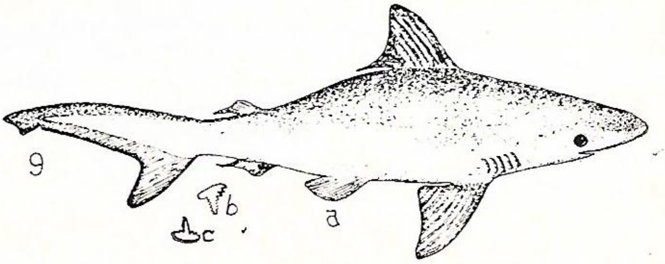
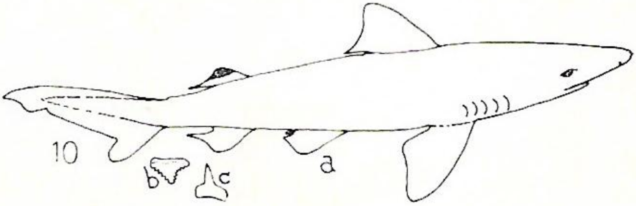
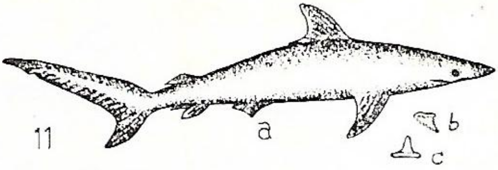


Fig. 7. **Hypoprion palasorrah** (Cuvier) (After Day).

Fig. 8. (a) **Carcharhinus gangeticus** (Muller & Henle) (After Muller & Henle), lateral tooth of (b) upper and (c) lower jaws.

Fig. 9 (a) **Carcharhinus limbatus** (Muller & Henle) (After Day), lateral tooth of (b) upper and (c) lower jaws.





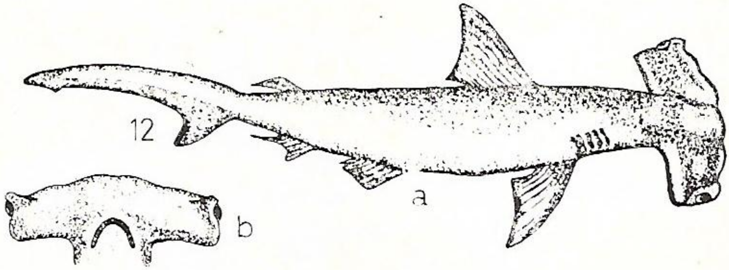
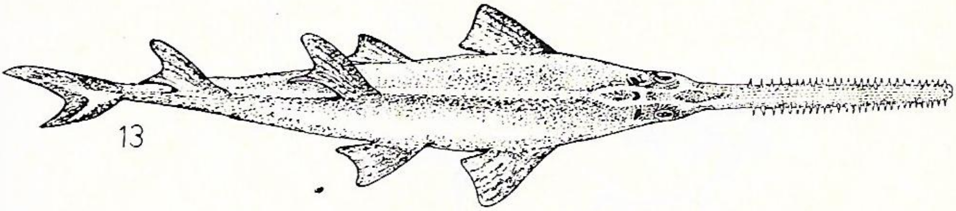
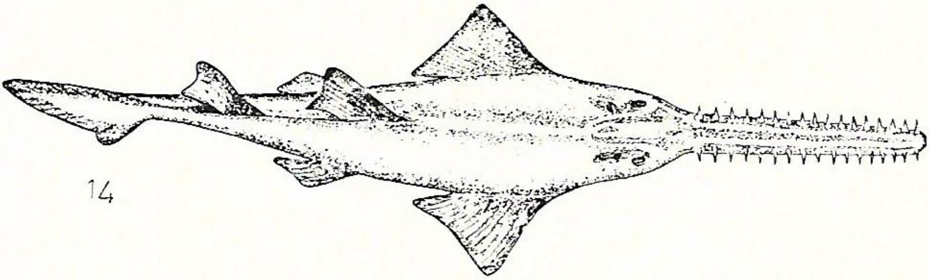


Fig. 10. (a) **Carcharhinus menisorrah** (Muller & Henle) (After Day), lateral tooth of (b) upper and (c) lower jaws.

Fig. 11 (a) **Carcharhinus sorrah** (Muller & Henle) (After Muller & Henle), lateral tooth of (b) upper and (c) lower jaws.

Fig. 12. **Sphyrna zygaena** (Linnaeus) (After Day), a) dorso-lateral view, b) ventral view.





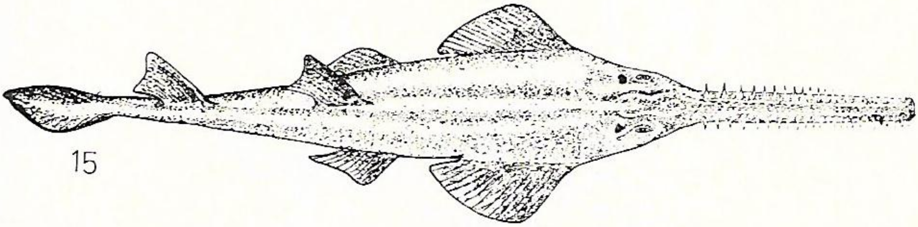
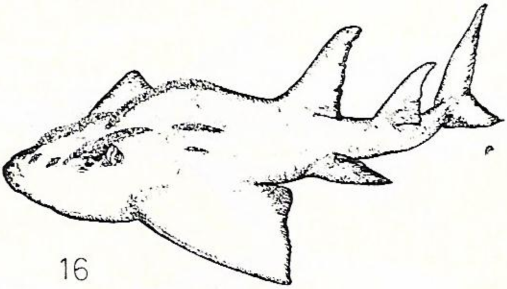


Fig. 13. **Pristis cuspidatus** Latham (After Day).

Fig. 14. **Pristis microdon** Latham (After Day).

Fig. 15. **Pristis zijsron** Bleeker (After Day).



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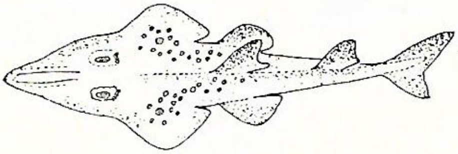

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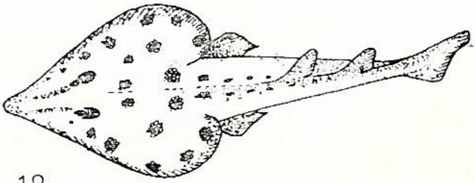

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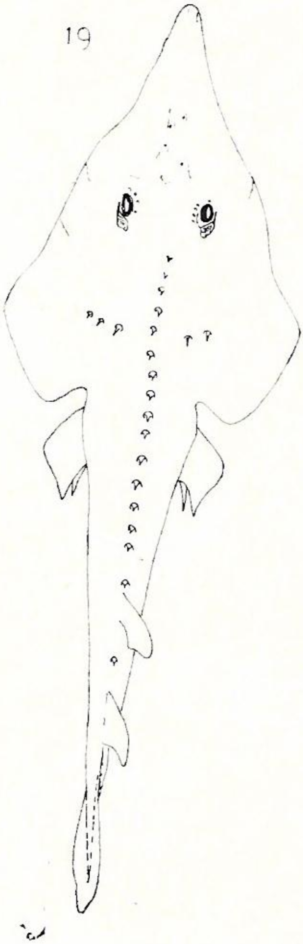
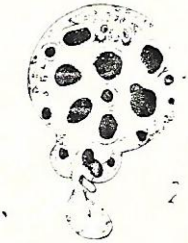
Fig. 16. **Rhina ancylostoma** Schneider.

Fig. 17. **Rhynchobatus djiddensis** (Forsskal) (After Day).

Fig. 18. **Rhinobatos annulatus** Muller & Henle (After Barnard).





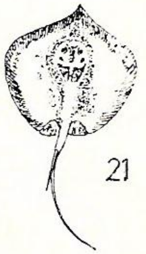
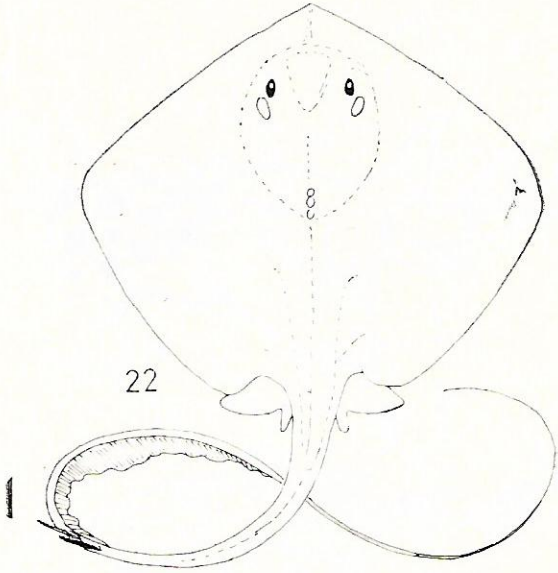


Fig. 19. **Rhinobatos granulatus** (Cuvier) (After Day).

Fig. 20. **Torpedo sinuspersici** Olfers (After Fowler).

Fig. 21. **Dasyatis imbricatus** (Schneider) (After Munro).



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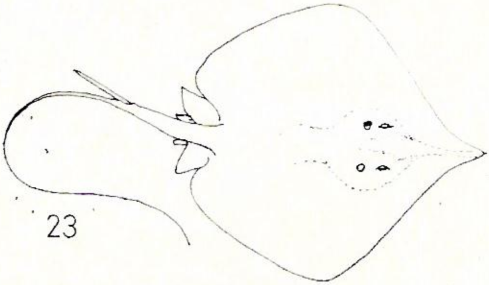

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Fig. 22. **Dasyatis sephen** (Forsskal) (After Day).

Fig. 23. **Dasyatis zugei** (Muller & Henle) (After Day).

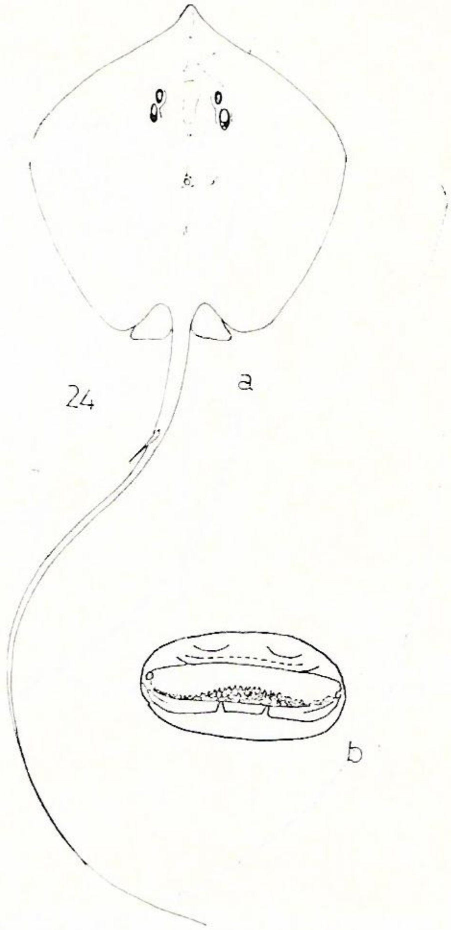

Fig. 24. (a) **Himantura bleekeri** (Blyth) (After Day), (b) mouth showing oral papillae (After Misra).

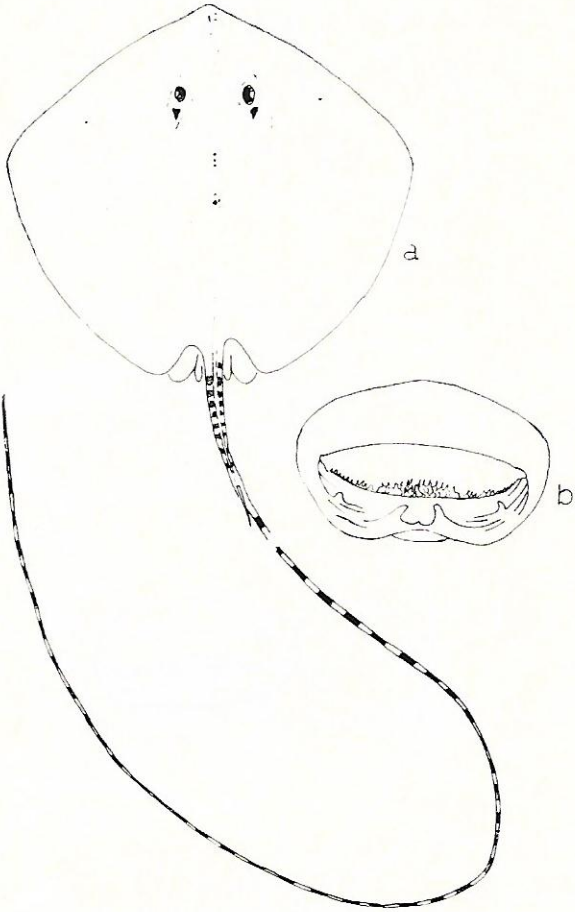

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Fig. 25. (a) **Himantura gerrardi** (Gray) (After Day), (b) mouth showing oral papillae (After Misra).

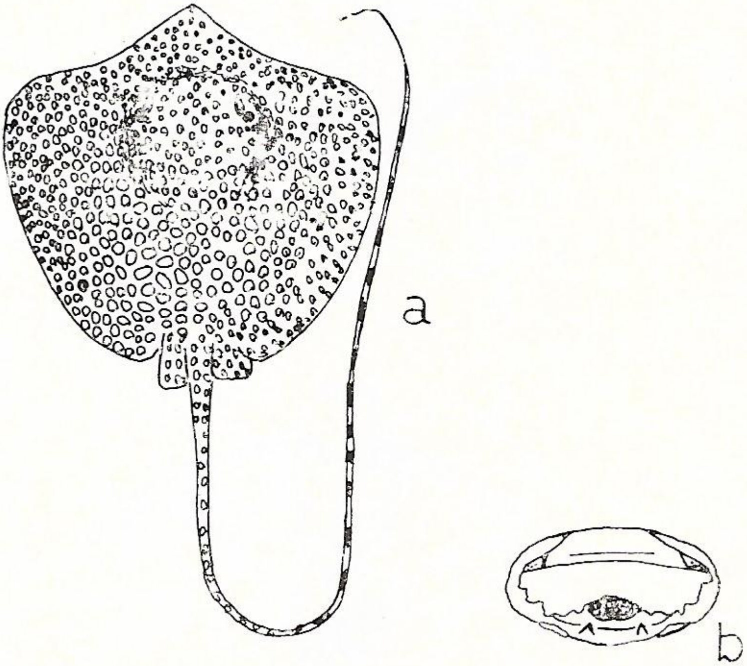

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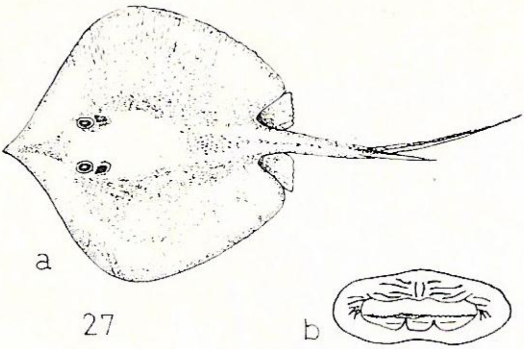
Fig. 26. (a) **Himantura uarnak** (Forsskal) (After Kuronuma & Abe), (b) mouth showing oral papillae (After Misra).



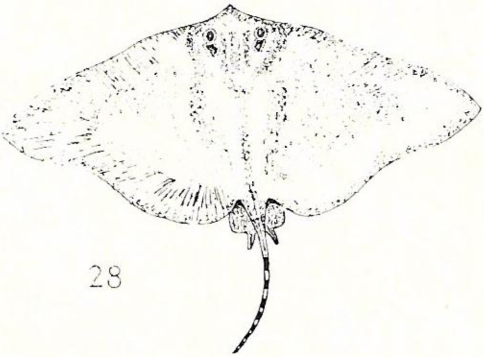
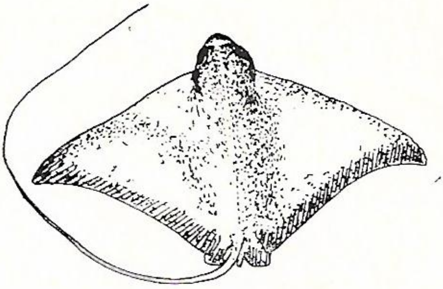


Fig. 27. (a) **Himantura walga** (Muller & Henle) (After Da
mouth showing oral papillae (After Misra).

Fig. 28. **Gymnura poecilura** (Show).



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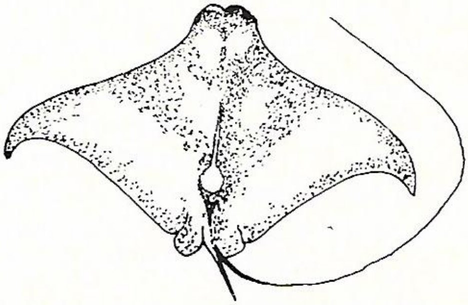

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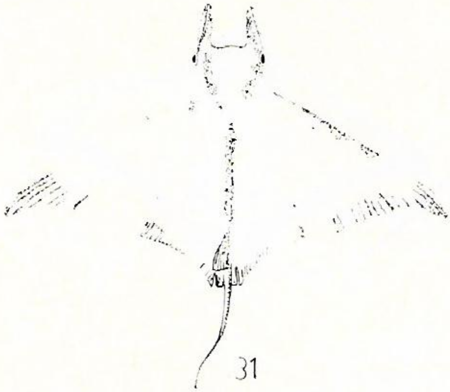
Fig. 29. **Aetomyleus nichoffi** (Schneider) (After Kuronuma & Abe).

Fig. 30. **Rhinoptera javanica** Muller & Henle (After Smith).



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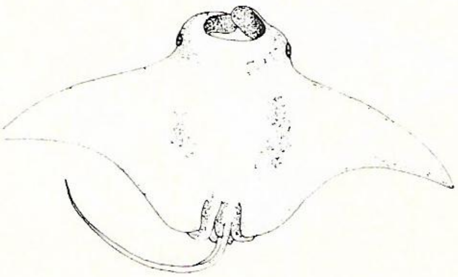

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Fig. 31. **Mobula diabolus** (Shaw) (After Day).

Fig. 32. **Manta ehrenbergii** (Muller & Henle) (After Fowler)